

WHAT IS CLAIMED IS:

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1. A method of producing a high frequency circuit chip having a substrate made of a ceramic with a high dielectric constant, a wiring pattern provided on one main surface of the substrate, an electric conductor layer provided on substantially all of another main surface of the substrate, and a through-hole including a connecting electrode for connecting the wiring pattern and the conductor layer to each other, the method comprising the steps of:

filling electrically conductive paste into a perforation in the substrate, and firing the paste to form the connecting electrode of the through-hole;

forming a resist pattern with an opening having a desired shape and size on the substrate;

forming a thin film with a wiring material on the substrate through the opening over the resist pattern after forming the resist pattern; and

removing the unnecessary wiring material thin film deposited on the resist pattern together with the resist pattern to form the wiring pattern on the substrate by a lift-off method.

2. A method of producing a high frequency circuit chip according to claim 1, wherein the conductor layer is formed by applying and firing electrically conductive paste.

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3. A method of producing a high frequency circuit chip according to claim 1, further comprising the steps of:
forming a protection film so as to cover the wiring pattern on the substrate, and
cutting the substrate along desired dicing lines to obtain the high frequency circuit chip.

4. A method of producing a high frequency circuit chip according to claim 1, further comprising a step of forming a thin-film resistor pattern which is connected to the wiring pattern.

5. A method of producing a high frequency circuit chip according to claim 1, further comprising the steps of:
mirror-polishing at least the surface of the fired substrate on which the wiring pattern is formed, and the fired substrate in which the through-hole having the connecting electrode is formed, and
thereafter forming the wiring pattern on the mirror-polished surface by the lift-off method.

6. A method of producing a high frequency circuit chip according to claim 1,

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wherein the substrate has a relative dielectric constant of at least about 10.

7. A method of producing a high frequency circuit chip according to claim 1, includes the step of forming the wiring pattern formed on at least one main surface of the substrate and the electric conductor layer formed on substantially all of the other main surface by a conductor pattern containing at least one metal selected from the group consisting of Ag, Cu, and Al as a major component and having a thickness of at least about 2 μm .

8. A method of producing a high frequency circuit chip according to claim 1, wherein the connecting electrode of the through-hole is formed by electrically conductive paste including at least one metal selected from the group consisting of Ag, Cu, and Al as a major component.

9. A high frequency circuit chip produced by the method defined in claim 1, comprising:
the substrate containing as a major component a ceramic with a high dielectric constant;
the wiring pattern disposed on one main surface of the substrate by the lift-off method;
the conductor layer disposed substantially on the whole of the other main surface of the substrate; and
the through-hole formed in the substrate, said through-hole including the connecting electrode for connecting the wiring pattern and the electric conductor layer.

10. A method of producing a high frequency circuit chip having a substrate made of a ceramic having a high dielectric constant, a wiring pattern disposed on each of front and back main surfaces of the substrate, and a through-hole including a connecting electrode for connecting the wiring patterns disposed on the front and back main surfaces of the substrate, the method comprising the steps of:

filling electrically conductive paste into a perforation in the substrate, and firing the paste to form the connecting electrode of the through-hole;

forming a resist pattern with an opening having a predetermined shape and size on the substrate;

forming a thin film with a wiring material on the substrate through the opening over the resist pattern after forming the resist pattern; and

removing the unnecessary wiring material thin film deposited on the resist pattern together with the resist pattern to form each wiring pattern on the substrate by the lift-off method.

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11. A high frequency circuit chip produced by the method according to claim 10, further comprising:

the substrate containing as a major component a ceramic with a high dielectric constant;

the wiring pattern provided on each of the front and back main surfaces of the substrate by the lift-off method; and

the through-hole provided in the substrate, said through-hole including the connecting electrode for connecting the wiring patterns provided on both of the front and back surfaces of the substrate.

12. A method of producing a high frequency circuit chip according to claim 10, further comprising the step of forming the wiring patterns formed on both of the front and back main surfaces of the substrate by forming a conductor pattern including at least one metal selected from the group consisting of Ag, Cu, and Al as a major component and having a thickness of at least about 2 μm .

13. A high frequency circuit chip according to claim 11, wherein at least the surface of the substrate on which the wiring pattern is disposed is mirror-polished.

14. A high frequency circuit chip according to claim 11, wherein the substrate has a relative dielectric constant of at least about 10.

15. A high frequency circuit chip according to claim 11, wherein the wiring pattern disposed on at least one main surface of the substrate and the electric conductor layer provided substantially on the whole of the other main surface include at least one metal selected from the group consisting of Ag, Cu, and Al as a major component, and have a thickness of at least about 2 μm .

16. A high frequency circuit chip according to claim 11, wherein the wiring patterns disposed on each of the front and back main surfaces of the substrate include at least one metal selected from the group consisting of Ag, Cu, and Al as a major component, and have a thickness of at least about 2 μm .

17. A high frequency circuit chip according to claim 11, wherein the connecting electrode of the through-hole includes at least one metal selected from the group consisting of Ag, Cu, and Al as a major component.

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